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Running head: STEREOTYPE THREAT AND ACHIEVEMENT GOALS IN SPORTS

**Do Achievement Goals Mediate Stereotype Threat? An Investigation on Females'  
Soccer Performance**

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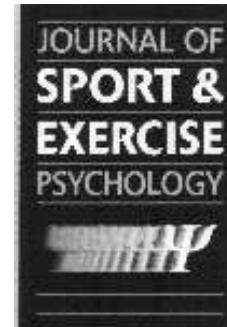
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### Abstract

This research investigated stereotype threat effects on women's performance in sports and examined the mediation of this effect by achievement goals. The influence of two stereotypes – relative to the poor athletic ability and the poor technical soccer ability of women – were studied. Fifty-one female soccer players were randomly assigned to one of three conditions, introducing the task as diagnostic of athletic ability, technical soccer ability, or sports psychology. Next, they filled out a questionnaire measuring achievement goals and performed a soccer-dribbling task. Results showed that compared to the control condition, females' performance significantly decreased in the athletic ability condition and tended to decrease in the technical soccer ability condition. Moreover, participants endorsed a performance-avoidance (relative to performance-approach) goal when the stereotypes were activated. However, this goal endorsement was not related to performance. The implications of these results for understanding the role of stereotypes in gender inequalities in sports are discussed.

Keywords: gender; motivation; sport; physical performance; sport psychology.

## Do Achievement Goals Mediate Stereotype Threat? An Investigation on Females' Soccer Performance

Although female participation in sports and physical activities has increased these latter decades (e.g., Riemer & Visio, 2003), gender differences in participation, interest and performance in this domain still exist. Several studies conducted in western countries showed that, compared to females, males practice sports more often (e.g., Fredricks & Eccles, 2005; Gibbons, Lynn, & Stiles, 1997; Papaioannou, Karastogiannidou, & Theodorakis, 2005), are more interested in physical education classes (e.g., Chen & Darst, 2002), and perform better in many motor tasks, especially those involving strength, power and speed (e.g., Bois, Sarrazin, Brustad, Trouilloud, & Cury, 2002; Eccles & Harold, 1991; see Thomas & French, 1985 for a meta-analysis).

In order to explain these gender differences, research in social psychology has emphasized the role of social stereotypes, defined as a set of beliefs about the attributes of a social group (Ashmore & Del Boca, 1981). In general, sports and physical activities are considered as a masculine domain (e.g., Fredricks & Eccles, 2005; Koivula, 1999). Most of this research is based on the idea that cultural stereotypes are learned and integrated in the self during the socialization process (e.g., Bem, 1981; Fredricks & Eccles, 2005; Koivula, 1999). As a result of this stereotype internalization, boys perceive themselves as more able and attach more importance to sports than girls (Eccles & Harold, 1991; Fredricks & Eccles, 2005), which contributes to the gender differences observed in sports participation and performance.

These studies are interesting because they demonstrate the role of stereotypes in gender differences in sports. However, they focused mainly on how stereotypes may

explain girls' disengagement and lack of interest in sports. Nevertheless, this is not the only way stereotypes may influence sports participation and performance. Indeed, research on stereotype threat (e.g., Steele, 1997) suggests that stereotypes may also affect individuals who have not internalized negative stereotypes about their ingroup, in other words, those who feel competent in and value a domain associated with negative ingroup stereotypes. According to stereotype threat theory, when a negative stereotype about a group's ability is made relevant in a test-taking situation, target individuals may fear being evaluated based on the stereotype. This evaluative threat creates an extra pressure that hampers their performance.

Stereotype threat has been examined in hundreds of studies and is a well-established phenomenon (for a review see Steele, Spencer, & Aronson, 2002). However, most of this research has been conducted in the academic domain (e.g., Croizet et al., 2004; Schmader, 2002; Spencer, Steele, & Quinn, 1999), and relatively few studies have investigated it in the athletic area (Stone & McWhinnie, *in press*; Beilock, Jellison, Rydell, McConnell, & Carr, 2006; Beilock & McConnell, 2004; Stone, 2002; Stone, Lynch, Sjomeling, & Darley, 1999). More particularly, these studies examined the effects of racial and gender stereotypes on motor performance. For example, in studies investigating the impact of racial stereotypes, Stone and colleagues (e.g., Stone, 2002; Stone et al., 1999) introduced a golf-putting task as diagnostic of athletic ability in order to activate the stereotype of the poor athletic ability of White individuals compared with Black individuals. Results showed that making this stereotype salient deteriorated White males performance on a golf-putting task (Stone et al., 1999) and decreased White participants' effort on the task (Stone, 2002).

Other studies have investigated the role of gender stereotypes in producing stereotype threat responses in a sports context. For example, Beilock et al. (2006) reported that male golfers performed poorly when they were told that women tend to perform higher than men on a golf-putting task. In a recent study, Stone and McWhinnie (in press) showed that females were susceptible to stereotype threat when their performance on a golf-putting task was linked to gender differences in sports. However, this study focused on female novice golfers, which does not address the question of how stereotype threat processes may impact the performance of female athletes who are highly committed to playing sports. The current study addresses this limitation by examining how the salience of negative gender stereotypes impact the athletic performance of female athletes who value and feel competent in sports.

Examining stereotype threat effects on experts instead of novices may also have implications with regard to mechanisms by which performance is impaired. Indeed, Beilock et al. (2006) showed that performance of golf experts was harmed when attention was allocated to proceduralized processes that normally run automatically. Accordingly, it is possible that findings of research using novices may not be generalized to experts. It seems thus necessary to empirically investigate stereotype threat on female high-level experts, and this was the goal of the current study. Moreover, the occurrence of stereotype threat in sports has been shown on a golf-putting task only (Beilock et al., 2006; Beilock & McConnell, 2004; Stone et al., 1999; Stone & McWhinnie, *in press*). In order to broaden our view of the phenomenon in the sports domain, this study used a different motor task, namely a soccer-dribbling task.

A second goal of this research was to study the mechanisms of stereotype threat. This question has been investigated many times, researchers examining various potential mediators such as anxiety (e.g., Steele & Aronson, 1995; Stone et al., 1999; Bosson, Haymovitz, & Pinel, 2004), evaluation apprehension (e.g., Spencer et al., 1999), self-handicapping strategies (e.g., Croizet & Claire, 1998; Stone, 2002) or performance confidence (e.g., Steele & Aronson, 1995). Some of these studies found a significant mediation of stereotype threat by affective (anxiety, Bosson et al., 2004) and cognitive variables (e.g., working memory capacity, see Schmader & Johns, 2003; attentional focus, see Beilock, Rydell, & McConnell, 2007; Croizet et al., 2004). However, the role of motivational variables in stereotype threat has been relatively rarely investigated (for exceptions see Brown & Josephs, 1999; Seibt & Förster, 2004; Smith, 2006; Smith, Sansone, & White, 2007). The current study examined a promising motivational variable that may play a role in the mechanisms of stereotype threat: the *achievement goals*.

According to the achievement goals theory (e.g., Elliot & Church, 1997), individuals in achievement contexts can pursue different goals. Specifically, when they define competence as outperforming others, they are likely to endorse a performance-approach goal, referring to the desire to perform better than the others, or a performance-avoidance goal, corresponding to the desire to avoid performing worse than the others. Whereas a performance-approach goal is usually associated with positive consequences on performance and motivation, performance-avoidance goal is associated with negative outcomes, such as increase in anxiety, loss of motivation, poor performance (e.g., Cury, Elliot, Sarrazin, Da Fonseca, & Rufo, 2002; Elliot & McGregor, 2001).

This latter goal could play a role in the mediation of stereotype threat. Indeed, a performance-avoidance goal is likely to be activated in test-taking situations focusing on failure, and this is probably what the fear of confirming a negative ingroup stereotype induces (e.g., Brown & Josephs, 1999; Seibt & Förster, 2004; Ryan & Ryan, 2005; Stone & McWhinnie, *in press*). For example, Seibt and Förster (2004) showed in a *regulatory focus*<sup>1</sup> framework (e.g., Higgins, 1997) that negative stereotypes with regard to task performance leads to avoidance-related behaviors such as better recall for avoidance-related statements, more accurate and analytical performance.

Smith (2004) has integrated performance-avoidance goals as a mediator of stereotype threat in the *stereotyped task engagement process* model. Specifically, this model predicts that a stereotype threat situation triggers a performance-avoidance goal that leads to self-regulation strategies (e.g., minimal effort, self-handicapping, minimal risk taking) and phenomenological experience (e.g., decrease in interest, anxiety, confidence) resulting in the performance decrease.

Based on this model, two studies examined the role of performance-avoidance goal in the mechanisms of ST (Smith, 2006; Smith, Sansone, & White, 2007). Smith (2006) reported that compared to men, women in a stereotype salient math situation had lower performance expectations for math. This relationship was mediated by the endorsement of performance-avoidance goal, which was higher for females than males. However, the design of this study does not rule out a possible gender effect: women may have endorsed a performance-avoidance goal more than men not because they were threatened by the stereotype, but because there might be a gender difference in performance-avoidance goal endorsement in the general population. Comparing women's



and men's performance-avoidance goal endorsement in a control condition would have been necessary to conclude that performance-avoidance goal mediated the stereotype threat effect.

In another research (Smith et al., 2007), achievement goals were manipulated along with stereotype threat. Results showed that females' interest in a computer science task was as low in the stereotype threat condition in which no achievement goals were activated, as in the stereotype threat condition in which performance-avoidance goal was activated. The authors suggested that this absence of difference in interest was due to the fact that performance-avoidance goal was "naturally" involved in the stereotype threat condition in which performance-avoidance goal was not activated. Although these are the first studies that empirically show that a stereotype threat situation may trigger a focus on performance-avoidance goal, performance has not been examined as a dependent variable. Thus, the role of achievement goals in stereotype threat remains unclear.

#### The current research

The primary goal of this research was to examine stereotype threat effects on female soccer players' performance on a soccer task and its mediation by performance-avoidance goals. An additional goal was to investigate the consequences of different stereotypes associated with sports. The effects of stereotype threat on females' sports performance has been demonstrated when females were reminded of their poor athletic ability compared to men (Stone & McWhinnie, *in press*). Although this stereotype is likely to be pervasive in sports because athletic ability is involved in most of the sporting activities (e.g., Ignico, 1989), female sports participants may be confronted with many other stereotypes. On the one hand, some stereotypes may be threatening to females when

they concern masculine sports such as boxing or rugby (e.g., Koivula, 1999). On the other hand, some stereotypes may be less threatening when they concern neutral or feminine sports such as swimming or figure skating (e.g., Koivula, 1999). In sum, the amount of threat experienced by females may differ according to the content of stereotypes associated with sports. Identifying which ones lead to stereotype threat effects could have important implications for understanding how to reduce gender differences in sports. In this study, the effect of the stereotype associated with natural athletic ability was compared to the effect of the stereotype associated with *technical soccer ability*.

Soccer is strongly considered as a masculine sport in most of European countries (e.g., Fontayne, Sarrazin, & Famose, 2002; Koivula, 1999). As an illustration, only 2% of soccer players in France are females (MJS Stat-Info, Ministry of Youth and Sports, 2004). A study of Fontayne et al. (2002) confirmed that this sport is perceived as very masculine in France. Indeed, the 361 boys and the 421 GIRLS of this study who were asked to rate soccer reported on average a score of respectively 2.10 and 1.94, on a 7-point scale ranging from 1 “very masculine” to 7 “very feminine”. This sport was even ranked just after boxing and rugby in its degree of masculinity.

Accordingly, introducing a task as diagnostic of soccer should remind females of the stereotype according to which “girls can’t play soccer”. When females identify with soccer – which is probably what female soccer experts do – the situation becomes threatening and may result in a decrease of performance on the task. However, technical ability may be perceived in a somewhat less masculine manner, because it involves coordination and precision, that are considered as feminine characteristics (Ignico, 1989; Metheny, 1965; Riemer & Visio, 2003). Therefore, the stereotype relative to technical

soccer ability was hypothesized to be less threatening than the stereotype associated with athletic ability.

In order to activate gender stereotypes in sports, previous research used an explicit manipulation. Stone and McWhinnie (*in press*) made the stereotype relative to the poor athletic ability of females salient by activating it blatantly. In the stereotype threat condition, females were told that they were going to perform a test of natural athletic ability that has been shown to produce gender differences. In the control condition, no mention about natural athletic ability and gender differences was made. Similarly, Beilock et al. (2006) activated stereotypes explicitly, by telling male golfers that women performed better than men on the golf-putting task they were going to perform.

Although females may be explicitly reminded of the stereotype in a natural context, stereotypes may also be activated more subtly. Indeed, previous studies showed that when a stereotype is well-known, implicit cues may be sufficient to make it salient (e.g., Croizet & Claire, 1998; Croizet et al., 2004; Schmader & Johns, 2003; Steele & Aronson, 1995; Stone et al., 1999). For example, Stone et al. (1999) introduced a task as diagnostic of natural athletic ability, reasoning that this framing would activate the stereotype about the poor athletic ability of White athletes. Indeed, results showed that White males performed more poorly in this condition than in the control condition.

In the current research, we hypothesized that the stereotypes relative to the poor athletic ability and technical soccer ability of females are so well known in France that merely introducing a task as diagnostic of one ability or the other would be sufficient to generate stereotype threat effects. Indeed, previous research showed the existence of a

stereotype according to which females have poor athletic ability (e.g., Biernat & Vescio, 2002; Knight & Guiliano, 2000), and soccer is considered as a very masculine activity in France (e.g., Fontayne et al., 2002).

More particularly, one experimental condition introduced the task as diagnostic of athletic ability. We predicted that as in Stone and McWhinnie (in press), this instruction would make the negative stereotype regarding female athleticism salient, which would then deteriorate in turn females' performance through performance-avoidance goal endorsement. A second experimental condition introduced the task as diagnostic of technical soccer ability. We hypothesized that this instruction would activate the negative stereotype about the poor soccer ability of females, which would also lead to stereotype threat effects through performance-avoidance goal endorsement. However, because technical ability involves feminine characteristics such as precision and coordination, we predicted that this stereotype would have less deleterious effects on performance than the stereotype associated with athletic ability.

## Method

### *Participants*

Participants were 51 females ( $M$  age = 20.3,  $SD$  = 5.9) playing competitive soccer for 7 years ( $SD$  = 5.1) and 4.5 hours per week ( $SD$  = 1.32) on average. They came from three soccer clubs of the communities of Grenoble (France).

### *Procedure and task frame manipulation*

The experiment took place during the regular training sessions on the soccer field, but far enough from the training session so that females were unable to see how their teammates performed on the soccer-dribbling task. After a 10-minute warm-up period,

the voluntary participants were greeted individually by a female experimenter who was blind to the hypotheses. The experimenter explained that they would complete brief questionnaires and perform a task. After completing a consent form, participants were asked to perform a soccer-dribbling task as fast as possible, and the time needed to perform it was used as the baseline performance (Time 1).

At this point, participants were randomly assigned to one of three task frame conditions. Based on manipulations used in previous research on stereotype threat in sports (Stone & McWhinnie, in press; Stone et al., 1999), the following instructions were given. In the athletic ability condition, the task was presented as measuring “personal factors correlated with athletic ability”, which was defined as “abilities related with strength, speed and power”. In the technical soccer ability condition, the task was presented as measuring “personal factors correlated with technical soccer ability”, which was defined as “the ability to lead the ball with rapidity and precision”. Finally, participants randomly assigned to the “sports psychology” control condition were told that the task measured “psychological factors”.

Following the task frame manipulation, participants filled out a questionnaire. On the first page, the instructions relative to the task frame manipulation were reiterated, and participants were asked to indicate their gender. Activating the gender category was designed to facilitate the activation of gender stereotypes (e.g., Steele & Aronson, 1995). The second page included the achievement goals scale. Once the questionnaire was filled out, the experimenter reminded participants of the type of ability measured by the task, just before they performed the soccer-dribbling task a second time (Time 2).

### *Measures*

*Soccer-dribbling task.* Based on the soccer-dribbling task described in Beilock, Carr, MacMahon, and Starkes (2002), the task required participants to dribble a soccer ball as fast as possible through a slalom course that consisted of six cones set 1 m apart. Given that previous studies showed that stereotype threat is likely to occur when the task is difficult (e.g., O'Brien & Crandall, 2003; Spencer et al., 1999), several constraints were added to the soccer-dribbling task: the participant was asked to conduct the ball with the dominant foot only, and the ball was not allowed to make contact with the cones. When these instructions were not followed, the participant was asked to place the ball near the cone preceding the one near where the error was committed, before continuing the slalom.

*Achievement goals.* The achievement goals were measured by a French version of the *Achievement Goals Questionnaire for Sports* (Conroy, Elliot, & Hofer, 2003). Three items measured performance-avoidance goal (e.g., "it is important for me to avoid being one of the worst performers on this test") and three items measured performance-approach goal (e.g., "it is important for me to perform better than the others on this test"). Participants answered on a 7-point Likert scale ranging from (1) strongly disagree to (7) strongly agree. A good internal consistency was found between the items measuring performance-avoidance goal ( $\alpha = .86$ ) and performance-approach goal ( $\alpha = .89$ ). The average of each scale was thus computed. In this study we examined the *absolute* endorsement of performance-avoidance goal and also the endorsement of performance-avoidance goal *relatively* to performance-approach goal, as done in some research on avoidance / approach personal goals (e.g., Elliot & Friedman, 2005; Heimpel, Elliot, & Wood, 2006). Indeed, we reasoned that the absolute value of performance-avoidance goal

would not give a full picture of the goals pursued by the participants. For example, a score of 3 on the performance-avoidance goal scale may have different meanings when compared to the score on the performance-approach goal scale: when this score is higher (e.g., 6), then performance-avoidance goal endorsement is relatively low, but when this score is lower (e.g., 1), then performance-avoidance goal endorsement is relatively high. Previous research has consistently shown that performance-approach and performance-avoidance goals are positively related (e.g., Cury, Elliot, Da Fonseca, & Moller, 2006; Elliot & McGregor, 2001). In other words, people endorsing performance-avoidance goals are also likely to endorse performance-approach goals. The question was thus to examine which of these two goals was primarily endorsed by the individuals.

Accordingly, we computed the difference between the average scores on the performance-avoidance and performance-approach goals scales (i.e., PAV–PAP goal score) for each participant. The more this score was positive, the more the participants endorsed a performance-avoidance (relative to performance-approach) goal.

*Soccer club level.* Given that the level of championship was different for the three clubs that took part in this study (from regional to national level), we used the soccer club level as a control variable in the analyses. More particularly, we assigned codes of 1, 2, or 3, according to the level of championship (the higher the level, the higher the code).

## Results

The means, standard deviations and zero-order correlations between the variables are presented in table 1.

*Task frame manipulation to performance.*

In order to examine whether task frame manipulation affected Time 2 Performance, an analysis of covariance (ANCOVA) was performed with Time 1 Performance and soccer club level as covariates to control for differences in initial level of performance, and with task frame manipulation (athletic ability vs. technical soccer ability vs. control) as a between-subjects factor<sup>2</sup>. The ANCOVA analysis yielded a significant effect of the task frame manipulation on Time 2 Performance,  $F(2, 46) = 4.43$ ,  $p = .01$ ,  $R^2 = .41$ . As can be seen on table 2, females performed better (i.e., completed the drill faster) in the control condition ( $AjM = 14.28$ ) than in the athletic ability condition ( $AjM = 17.59$ ),  $F(1, 46) = 8.82$ ,  $p = .005$ . In addition, females tended to perform higher in the control condition than in the technical soccer ability condition ( $AjM = 16.08$ ),  $F(1, 46) = 2.82$ ,  $p = .10$ . No other significant differences emerged from the analyses.

*Task frame manipulation to achievement goals.*

Next, we examined whether task frame manipulation affected achievement goals by performing the ANCOVA on performance-avoidance (relative to performance-approach) goals (i.e., the PAV–PAP goal score), and on the absolute values of performance-avoidance and performance-approach goals. These analyses showed that task frame manipulation significantly affected the PAV–PAP goal score,  $F(2, 46) = 3.48$ ,  $p = .04$ ,  $R^2 = .17$ . As can be seen on table 2, participants endorsed performance-avoidance (relative to performance-approach) goals more in the athletic ability condition ( $AjM = 0.64$ ) than in the control condition ( $AjM = -0.12$ ),  $F(1, 46) = 6.28$ ,  $p = .01$ . In addition, females in the technical soccer ability condition tended to endorse performance-avoidance (relative to performance-approach) goals more ( $AjM = 0.46$ ) than participants



in the control condition,  $F(1, 46) = 3.88, p = .05$ . No other significant differences emerged from this analysis. ANCOVA analyses performed on the absolute values of performance-based goals showed that neither performance-avoidance nor performance-approach goals varied significantly across conditions,  $F(2, 46) = 0.67, p = .52$  and  $F(2, 46) = 0.95, p = .39$ , respectively.

### *Mediational analyses*

This first set of analyses showed that task frame manipulation affected both Time 2 Performance and performance-avoidance (relative to performance-approach) goals. Mediational analyses were thus carried out to examine whether performance-avoidance (relative to performance-approach) goals mediated the task frame manipulation – performance relationship. According to Baron and Kenny (1986), four conditions are necessary to demonstrate mediation: (1) the independent variable  $X$  (i.e., task frame manipulation) significantly predicts the dependent variable  $Y$  (i.e., Time 2 performance); (2)  $X$  predicts the mediational variable  $M$  (e.g., performance-avoidance goal); (3)  $M$  predicts  $Y$  when controlling for the relationship between  $X$  and  $Y$ ; (4) the relationship between  $X$  and  $Y$  is non significant (complete mediation) or significantly decreases (partial mediation) when controlling for the relationship between  $M$  and  $Y$ .

Given that framing the task as diagnostic of athletic ability did not affect performance in the same way as framing it as diagnostic of technical soccer ability, two separate mediational analyses were performed. A first series of regression analyses included an *athletic ability contrast*, which compared the athletic ability condition (-1) to the control condition (+1), and a second series of analyses included a *technical soccer*

*ability contrast*, which compared the technical soccer ability condition (-1) to the control condition (+1).

When Time 2 performance was regressed onto the athletic ability contrast, Time 1 Performance and soccer club level, the overall model was significant,  $F(3,29) = 9.14$ ,  $p < .001$ ,  $R^2 = .49$ . Results showed that Time 1 performance and the athletic ability contrast were significant predictors of Time 2 performance ( $\beta = .54$ ,  $p = .001$  and  $\beta = -.45$ ,  $p = .003$  respectively), confirming the ANCOVA analysis. No other significant effect emerged from this analysis. A second regression analysis including the same predictors showed, also as expected, that the athletic ability contrast significantly predicted PAV–PAP goal score ( $\beta = -.45$ ,  $p = .01$ ). Finally, when Time 2 Performance was regressed on the athletic ability contrast, Time 1 Performance, soccer club level and the PAV–PAP goal score, the overall model was significant,  $F(4, 28) = 6.64$ ,  $p = .001$ ,  $R^2 = .49$ . The athletic ability contrast significantly predicted Time 2 performance ( $\beta = -.43$ ,  $p = .01$ ) along with Time 1 performance ( $\beta = .53$ ,  $p = .002$ ). However, the PAV–PAP goal score and soccer club level were not significant predictors of Time 2 performance ( $\beta = .03$ ,  $p = .83$  and  $\beta = -.15$ ,  $p = .32$ ) (see figure 1).

When Time 2 performance was regressed onto the technical soccer ability contrast, Time 1 Performance and soccer club level, the overall model was significant,  $F(3,31) = 6.11$ ,  $p = .002$ ,  $R^2 = .37$ . Time 1 performance significantly predicted Time 2 performance ( $\beta = .58$ ,  $p = .001$ ) and the technical soccer ability contrast was a very marginal predictor of Time 2 Performance ( $\beta = -.23$ ,  $p = .12$ ), corroborating the ANCOVA analysis. No other significant effect emerged from the analyses. Also as expected, the technical soccer ability contrast marginally predicted PAV–PAP goal score

( $\beta = -.34, p = .06$ ). Finally, when Time 2 Performance was regressed on the technical soccer ability contrast, Time 1 Performance, soccer club level and the PAV-PAP goal index, the overall model was significant,  $F(4, 30) = 4.75, p = .004, R^2 = .39$ . Results indicated that Time 1 performance significantly predicted Time 2 Performance ( $\beta = .58, p = .001$ ). However, the technical soccer ability contrast, the PAV-PAP goal index and soccer club level were not significant predictors of Time 2 performance ( $\beta = -.19, p = .24, \beta = .14, p = .38$  and  $\beta = -.04, p = .80$ , respectively) (see figure 1).

### Discussion

This research was aimed at examining stereotype threat effects on females' sports performance and the mediation of this effect by achievement goals. The analyses of the soccer performance data revealed a stereotype threat effect when the stereotype relative to the poor females' athletic ability was made salient and a marginal stereotype threat effect when the stereotype relative to the poor females' technical soccer ability was activated. In other words, females performed lower in the athletic ability condition and tended to perform lower in the technical soccer ability condition than in the control condition. Along with Time 1 Performance, the task frame manipulation accounted for 40% of the variance of Time 2 Performance, which is a significant proportion. These results corroborate previous research indicating that the stereotype associated with poor athletic ability had deleterious effects on females' performance on a golf-putting task (Stone & McWhinnie, *in press*). It also provides an extension to the literature by showing that females who are experts in the stereotyped domain may be susceptible to stereotype threat, and that this effect may occur on motor tasks different from the golf-putting task

habitually used (e.g., Beilock et al., 2006; Beilock & McConnell, 2004; Stone et al., 1999; Stone & McWhinnie, *in press*).

Although performance in the athletic ability condition did not significantly differ from performance in the technical soccer ability condition, results suggest that participants were not affected in the same way by the two stereotypes. Indeed, compared to the control condition, performance in the athletic ability condition significantly decreased whereas performance in the technical soccer ability condition only marginally decreased. When the task was introduced as diagnostic of athletic ability, it might have been perceived as more masculine than when it was introduced as diagnostic of technical soccer ability. Indeed previous studies showed that the characteristics associated with athletic ability such as strength, speed or power are considered as masculine (e.g., Solmon, Lee, Belcher, Harrison, & Wells, 2003), whereas characteristics such as fine motor skills are seen as feminine (e.g., Ignico, 1989). Although soccer is perceived as a very masculine activity in France (e.g., Fontayne et al., 2002), emphasizing fineness and precision might have made the task somewhat less threatening, explaining in turn why it weakly affected performance. This research suggests that different stereotypes associated with sports may have differential effects on females' sport performance, and it would be interesting in future research to examine a larger variety of stereotypes (e.g., associated with aggressiveness, competitiveness, esthetics) in order to determine which have the most deleterious effects on females' performance. Identifying which stereotypes are the most powerful could help teachers and sports instructors avoid them and reduce their negative effects on females' performance.

Finally, the analyses showed that participants endorsed a performance-avoidance (relative to performance-approach) goal more in the threatening conditions than in the control condition, corroborating the hypothesis that a stereotype threat situation generates a focus on performance-avoidance goal (Smith, 2004, 2006; Stone & McWhinnie, *in press*; Ryan & Ryan, 2005), relatively to performance-approach goal. Performance-avoidance goal has been shown to be a less optimal regulatory structure than performance-approach goal, by increasing anxiety (e.g., Cury et al., 2002; Elliot & McGregor, 1999), use of self-handicapping strategies and reducing performance (e.g., Elliot, Cury, Fryer, & Huguet, 2006; for a review see Elliot, 1999). However, the endorsement of performance-avoidance (relative to performance-approach) goal was not related to performance in the current research. A methodological limitation may explain these results. Indeed, although we used a valid and recent measure of achievement goals in sports (Conroy et al., 2003), this measure might not have been specific enough to the situation. Indeed, when asking participants to indicate the extent to which they wanted to perform better/avoid performing worse than *the others*, they could have defined the others in different ways: females, males, or both. This lack of clarity in the standard of comparison might explain why performance-avoidance goal did not mediate the stereotype threat effect, and future research should use a more specific achievement goals measure. Another potential explanation is that the relationship between performance-avoidance and performance varies depending on dispositional variables such as achievement motives. For example, research showed that performance-approach goal has positive effects on performance only when the individuals' need for achievement is high, but not when they focus on failure (e.g., Elliot, 1999). Moreover, research on the

regulatory focus theory (e.g., Higgins, 1997) showed that a focus on failure in a particular situation (i.e., endorsement of a prevention goal) is associated with negative outcomes only when there is a mismatch between this situational focus and the goal usually endorsed by the individual, in this case his/her need for achievement (e.g., Lockwood, Jordan, & Kunda, 2002). Future research should take into account dispositional variables such as the achievement motives to examine the conditions under which stereotype threat may be mediated by the achievement goals. The lack of dispositional variables as predictors of achievement goals in this study could also explain why the stereotype manipulation accounted for only 13% of the variance of performance-avoidance (relative to performance-approach) goals.

Another promising direction of research would be the integration of the achievement goals with other potential mediators of stereotype threat. Based on previous research showing the negative effects of performance-avoidance goal on anxiety, competence valuation, task absorption and intrinsic motivation (e.g., Cury et al., 2002), examining a multiple mediator chain model integrating these different mediators would enhance our understanding of the mechanisms of stereotype threat (e.g., Smith, 2004; Smith et al., 2007).

To conclude, whereas previous studies showed how gender stereotypes may explain females' disengagement and loss of motivation for sports (e.g., Fredricks & Eccles, 2005; Koivula, 1999), this research indicated that even females who value a domain associated with negative ingroup stereotypes may be susceptible to stereotype effects, suggesting that stereotypes may affect females in a variety of ways.

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End notes

1. The approach / avoidance dimension is also integrated in the regulatory focus theory. According to this model, individuals can pursue two different kinds of regulatory goals: promotion and prevention. Promotion goals entail striving to achieve an ideal self and involve the eager pursuit of gains or successes. In contrast, prevention goals entail striving to avoid disasters and involve the vigilant avoidance of losses or failures.

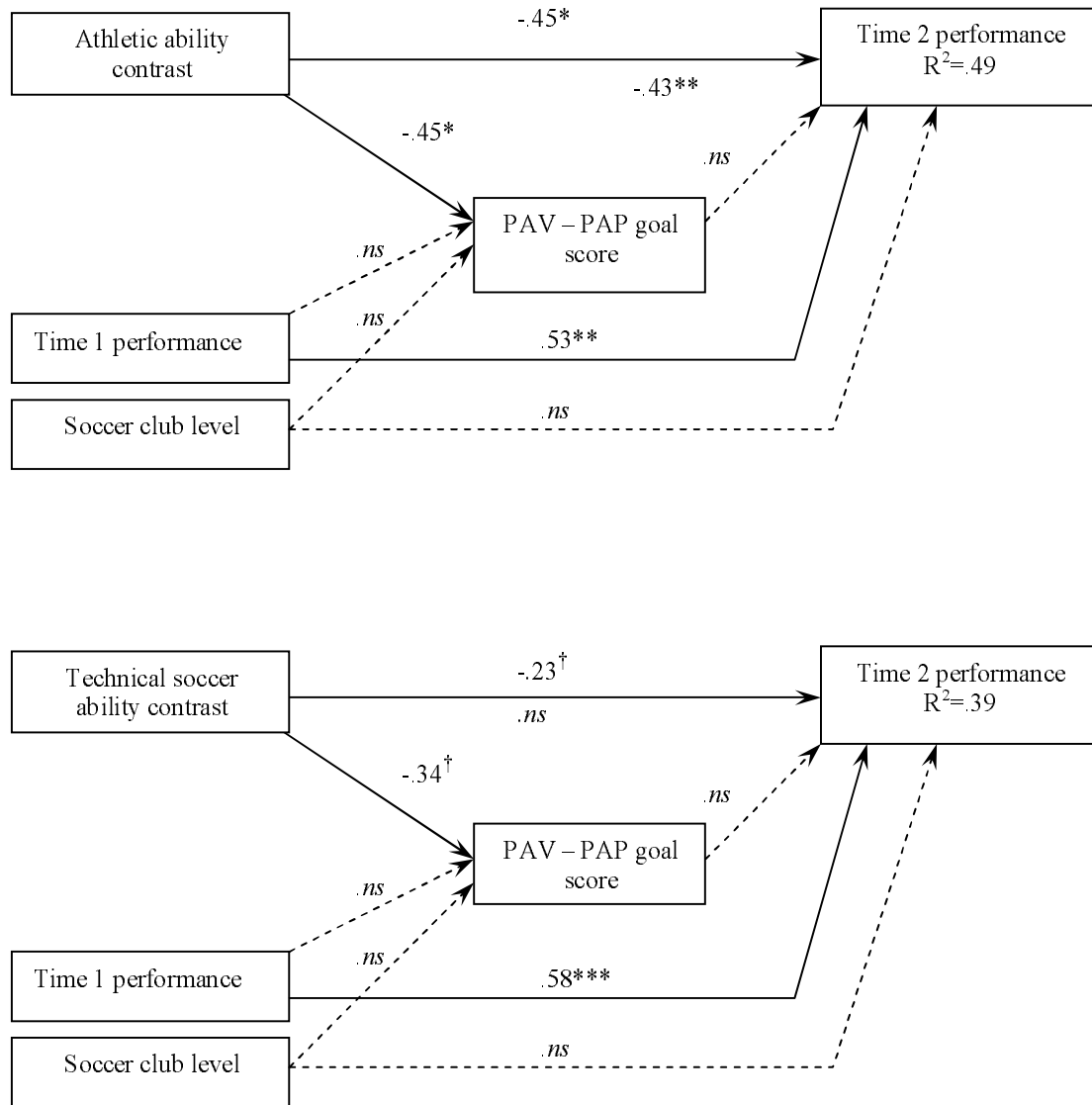
2. The interaction between the covariates and the task frame manipulation were not significant ( $F$ 's  $< 1$ ), indicating that the homogeneity of regression assumption was met.

Figure Captions

*Figure 1.* Models testing the mediation of the effect of the athletic ability and technical soccer ability contrasts on performance by performance-avoidance (relative to performance-approach) goals.



Figure 1.



*Note.* Athletic ability contrast was coded as follow: athletic ability condition = -1; control condition = +1. Technical soccer ability contrast was coded as follow: technical soccer ability condition = -1; control condition = +1. Path values are standardized regression coefficients from the regression analyses. The regression coefficients shown above the

arrow from the stereotype manipulation contrasts to Time 2 performance are from an analysis in which the effect of the stereotype manipulation is statistically controlled for Time 1 performance and soccer club level; the coefficients below these arrows are controlled for Time 1 performance, soccer club level and performance-avoidance (relative to performance-approach) goal score (i.e., PAV – PAP goal score).

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ ; <sup>†</sup>  $p < .12$ .

Table 1.

*Intercorrelations Among Variables (N = 51)*

Variable	<i>M</i>	<i>ET</i>	1	2	3	4	5	6	7	8
1. Athletic ability contrast	-	-	-							
2. Technical ability contrast	-	-	-	-						
3. Time 1 performance	16.18	4.61	.19	.09	-					
4. Performance-avoidance goal	3.82	1.82	-.06	-.22	-.16	-				
5. Performance-approach goal	3.50	1.72	.15	-.06	-.10	.87***	-			
6. PAV–PAP goal score	0.32	0.90	-.41*	-.33*	-.12	.35*	-.15	-		
7. Time 2 performance	15.95	3.95	-.35*	-.18	.53***	.08	.04	.09	-	
8. Soccer club level	2.17	0.86	.03	.07	-.31*	-.04	-.14	.19	-.27 <sup>†</sup>	-

*Note:* PAV = performance-avoidance, PAP = performance-approach. The correlations between the contrast variables are omitted because they are of little conceptual value.

\*\*\*  $p < .001$ ; \*  $p < .05$ ; <sup>†</sup>  $p < .10$ .

Table 2.

*Effect of Task Frame Manipulation on Time 2 Performance and Performance-avoidance (Relative to Performance-approach) Goals.*

Variable	Task frame manipulation					
	Athletic ability		Technical soccer ability		Control	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Time 2 performance (seconds)	17.59	3.52	16.08	4.57	14.28	3.95
PAV–PAP goal score	0.64	0.95	0.46	0.86	-0.12	0.76

*Note.* Means are adjusted for Time 1 performance and soccer club level. An increase in seconds indicates a decrease in performance on the task. An increase in PAV–PAP goal score indicates that performance-avoidance goal endorsement is more important than performance-approach goal endorsement.